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Sixteen Million Neighbors

A Multilevel Study of the Role of Neighbors in the Personal Networks of the Dutch

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This article discusses the role of neighbors in the personal networks of people living in the Netherlands. It aims to establish the conditions for the inclusion of neighbors in such a network. Three complementary theoretical perspectives for developing hypotheses are employed: meeting opportunities, sharing groups, and social capital. Arguments are tested using nationally representative data ($N = 902$) and multilevel regression models. The results show that all three perspectives contribute to explain the number of neighbor relations in personal networks, although none of the theoretical perspectives is fully confirmed. Interestingly, local facilities such as primary schools and day care facilities, which draw their members not only from the neighborhood but also from a larger local area, influence the likelihood of including neighbors in personal networks: primary schools encourage these relations, while the existence of day care facilities discourages neighboring.

Keywords: *neighbor relationships; multilevel analysis; meeting opportunities; explanation of neighboring*

We make friends, we make foes, and God makes the neighbor next door.

—Gilbert Keith Chesterton

Why Study Neighbor Relationships?

Neighborhood relationships are a key indicator of the strength of local social communities. In the past, much research was done on these relationships, and now the issue of a decline of community is back on the research agenda (see, e.g., Putnam 2000). Yet, there are more reasons for the renewed interest in relationships among neighbors. First, neighbor relations enable

the study of what people make of their contact opportunities (cf., Festinger, Schachter, and Back 1950; Verbrugge 1977; Feld 1981). The local area where people live is a meeting place, where, in principle, all inhabitants can interact and start relationships with one another. Hence, local areas are an optimal research ground for the study of how strangers are transformed into friends. Furthermore, neighbor relations are usually weak, and weak ties are probably a more sensitive measure of social cohesion and integration than strong ties (see Granovetter 1973). Moreover, there are, as yet, few empirical-theoretical studies on the importance of local relationships for social life. Last but not least, methodological developments (such as multilevel models) for the analysis of data at different aggregation levels (e.g., network relations nested within individual persons who live in larger local areas) provide another reason for renewed interest in the subject.

The aim of this contribution is to determine the role of neighbors in the personal networks of the Dutch and to explain why some people include neighbors in their network and others do not. In so doing, we add the "Dutch case" to the existing literature on urban sociology, which is currently largely concentrated on the United States (see below). The situation in the Netherlands might be different from that in the United States because the Netherlands is a country with a high population density and a high level of urban planning, including a well-developed system of public transportation and a high level of planning of the built environment in general. Therefore, differences between social life in the cities and that in the countryside are probably smaller in the Netherlands than in the United States.

The remainder of this article is organized as follows. The next section reviews existing empirical results on neighbor relationships. The third section discusses three theoretical perspectives along with their resulting hypotheses. The fourth section looks at the data, measurements, and methods used. The fifth section presents the results of our analysis, and the last section draws conclusions and discusses the findings.

Basic Knowledge on Neighbor Relationships

Though the study of neighbor relations has gained popularity during the last decades, only a few conclusive statements can be made because of the use of different designs, measures, and methods of analyses. Some studies just compare two neighborhoods, while others focus on a particular street or particular social groups living in a specific local area. Furthermore, different instruments have been used for data collection,

ranging from qualitative ones such as participation, social observation, and in-depth interviews, to standardized questions in large quantitative surveys. Even the definition of *neighbor* differs among empirical studies. There is considerable variation in the size of the areas considered neighborhoods—sometimes it is just a street, yet at other times it covers blocks where more than 20,000 people live. A number of studies just left it up to the respondent to decide who to call a neighbor. Despite these differences, a few basic conclusions can be drawn on the general nature of neighbor relationships.

With regard to their quantity, neighbors are an important relational category in a personal network. Neighbors constitute 7% to 19% of a person's personal network (see, e.g., Fischer 1982, 41; Wellman, Carrington, and Hall 1988, 143; Van Busschbach 1992; Van Busschbach, Flap, and Stokman 1999; Van der Poel 1993). The share of neighbors in the network of strong ties, the *core discussion network*, is smaller, about 7% to 9% (Marsden 1987, 1990; see also Burt 1984; Fischer 1982).

As to the quality of neighborhood relationships, case studies (e.g., Campbell and Lee 1992) as well as population surveys (e.g., Fischer et al. 1977; Fischer 1982; Van der Poel 1993) show that the typical neighbor relationship is weak and not multiplex. There are, however, relevant differences between social groups in the quality of neighbor relationships. Lee and Campbell (1999), for example, showed in their study in Nashville that Blacks have more intensive neighbor relations than Whites. Research results have been mixed on whether the quality of relationships among neighbors can be influenced by housing policy; in particular, whether a local mix of rented housing and housing in private ownership can lead to a social mix in neighborhood relations (Crow and Allan 1994; Musterd and Andersson 2005; Völker and Flap 1997).

The content of neighbor relationships is diverse and usually relates to all kinds of practical help (Fischer 1982, 176). For example, 47% of neighbors take care of their neighbor's house during the latter's vacation. Furthermore, neighbors usually exchange small items and lighter forms of instrumental help (this finding was also established for the Netherlands; see Thomese 1998). Neighbors rarely discuss personal matters, exchange advice on life changes, or lend one another large amounts of money.

Studies related to trends in neighborhood relationships are rare, mainly because of a lack of appropriate data. The study by Guest and Wierzbicki (1999) is an exception. They analyzed two decades of data of the General Social Survey in the U.S. and found that there is indeed a trend toward less neighboring and that residents participate in a growing number of extraneighborhood activities.

Lelieveldt (2004), among others, offers a more general reason for studying neighbor relationships. His research on deprived neighborhoods in the Netherlands showed that contacts among neighbors have important consequences for the quality of the local environment. Contacts among neighbors are among the strongest predictors of inhabitants' ability to deal with problems of social and physical disorder.

Apart from the few researches mentioned above, little is known about relations among neighbors in the Netherlands, which is remarkable given the high population density and high degree of urbanization of the country. Therefore, as mentioned, next to the test of theoretical arguments on the likelihood of neighbor relations in personal networks, this study aims to contribute the Dutch case to existing knowledge.

Explaining Relationships Among Neighbors: Opportunities, Interdependency, and Incentives for Relational Investment

To start a relationship, people have to meet. Opportunities for interaction are thus a prerequisite for the emergence of relationships. Also, people might need to cooperate to attain goods that they could not access via solitary actions; therefore, people form *sharing groups*. People also start relationships and invest in others with an eye to the value of future help. According to this social capital theory, people invest in neighbors to achieve certain ends, while remaining subject to the restrictions of meeting chances and mutual interdependencies. In the following, these three mechanisms are discussed in more detail and applied to neighbor relationships.

Meeting Opportunities

There is no "mating" without meeting (Verbrugge 1977). The population composition of the places where people live and work constitutes the opportunity structure for meeting others (Blau 1962, 1978; Feld 1981, 1984; Fischer et al. 1977; Fischer 1982). For relationships other than neighbors, studies have established the importance of meeting opportunities for social interactions. McPherson and Smith-Lovin (1987) showed that the homogeneity of friendship relationships among members of voluntary organizations is highly dependent on the composition of the group. Marsden (1990) demonstrated that the composition and diversity of discussion

networks reflects the composition of the set of others to whom an individual has access. Kalmijn and Flap (2001) showed that social settings, like work organizations, neighborhoods, schools, voluntary associations, and churches, promote similarity of marriage partners with respect to age, education, religion, and class.

In a given local area, such as a neighborhood, people need no extra arrangements to meet. Therefore, the area where people live is a particularly important meeting setting, not only because people spend a lot of time there, but also because they cannot avoid meeting those who live next door. Moreover, the places where people are active, such as parks, playgrounds, or libraries, are usually located close to where they reside. In her study on social contexts and friendship choice, Verbrugge (1979) noted that having a friend in a particular setting increases the likelihood of having still more friends in that same setting. One meets new people indirectly via the first interaction partner, and networks of positive ties tend to grow dense (Granovetter 1973). Putting these arguments together, our first hypothesis is as follows: The likelihood of including a second (third or fourth) neighbor in a network is greater than the likelihood of including the first one.

Furthermore, in line with this reasoning, our second hypothesis is that facilities in a local area, like schools and a bus station, promote social contacts (see Feld 1981). Facilities are usually dealt with in the field of geography and often studied with respect to the spatial distribution of the provision of consumer goods and other kinds of services. Seldom have they been viewed as a prerequisite for the formation of social relationships.

In addition, if one is not present at a certain place, no others can be met and no relationship can be built. Hence, time spent in the local area increases the chances of meeting neighbors.¹ This leads to our third hypothesis: All conditions that cause people to spend more time in the area where they live will facilitate contacts among neighbors. However, to develop neighborhood relations, it is not enough that an individual spends time in the neighborhood; other neighbors have to be present too. Similarity in background characteristics probably indicates similarities in lifestyles and rhythm; that is, a synchronization of time schedules. In his survey of the networks of Californians, Fischer (1982, 100) reported that neighborhood contact is less frequent in low-income neighborhoods than in higher income neighborhoods, since the former exhibit more variety than the latter with regard to race, ethnicity, and occupation. Our fourth hypothesis, therefore, is that similarity in background characteristics enhances neighborhood contacts.

Sharing Groups

Neighbors are always interdependent to some extent. Even without direct interaction, neighbors are informed about each other's lives, habits, job, visits, quarrels, and so forth. The ease of interaction as well as the interdependencies among neighbors decrease with physical distance (see Athanasiou and Yoshioka 1973). A number of other types of interdependencies are based on individual goals and actual interactions. The relevant ideas formulated on these types of interdependencies go back to the economist Buchanan and have been applied to sociological problems by Lindenberg (1982). This sharing group theory assumes that individuals choose to share the costs of production or consumption of goods that they cannot afford individually. Social contacts are a by-product of this sharing; that is, contacts are established because of the arrangements that have to be made. For example, sharing a parking lot forces people to communicate with each other, and the resulting relationships can be seen as a by-product.

Theory predicts that in groups where interdependency is low, contact is rare. If everyone has all they need, there is no need for cooperation; therefore, fewer relationships will emerge. All conditions that make individuals interdependent influence the quality and quantity of contacts among neighbors. Hence, our fifth hypothesis is: A person who has few resources will establish more contacts with their neighbors and vice versa. The same holds true for economic well-being of the area in general: If the area is rich, contacts among neighbors will be scarce (hypothesis 6). Furthermore, because of resource scarcity, an individual will need many kinds of support from others. Our next hypothesis is therefore that a person who needs many different kinds of help will engage in more contacts with neighbors (hypothesis 7). In line with this argument, the number of facilities in the area also matters. In accordance with the sharing group theory, more facilities that provide goods and services lead to less dependency and hence to fewer relationships among people in general and among neighbors in particular. For example, if supermarkets are easily reached and open in the evenings, borrowing sugar from a neighbor becomes less likely. Furthermore, if a child care center is easily available, the likelihood of asking a neighbor to care for one's children diminishes. Consequently, our hypothesis is that the number of contacts among neighbors will be higher if there are few facilities in the area (hypothesis 8). Note that this last hypothesis contradicts hypothesis 2 on the positive association between the number of facilities in an area and contacts among neighbors.

Social Capital

Both theoretical perspectives discussed above conceive relationships as a by-product of occasional meetings or of interaction serving another purpose. The social capital theory assumes that individuals adopt a more active stance. According to the theory, the more social capital people have, the better able they are to achieve their goals (Bourdieu 1981; Coleman 1990; Flap 1999).² Relationships are another means to improve or safeguard one's living conditions. This implies an investment theory of social relationships: Ties come about because people invest in others, taking into account the present value of future support. The social capital in a personal network consists of the number of relationships that can be mobilized to provide support. It is not only the presence of other network members that is important, it is also crucial that these others are able and willing to help (Bourdieu 1981; Flap 1999). According to the theory, a shared future and past are important conditions motivating one to make or maintain contact. Hence, the length of time one has lived in a certain area and one's intention to stay there enhance the amount and quality of local contacts (hypothesis 9; see Campbell 1990; Van der Poel 1993; Sampson 1988; Sampson, Raudenbush, and Earls 1997).³

It can be argued further that many kinds of assistance, particularly help in case of emergencies, can best be provided by people who are readily available. Compared to other network members, neighbors are the ones who are best available (except for household members). Our argument is that neighbors are especially able to help each other with problems that require no special resources or problems where a "reversal of fate" is likely: one neighbor's problem today might be another's problem tomorrow. This concerns help needed with small jobs, borrowing items, and circumstances that require quick, immediate action and where direct availability is an important issue. Our tenth hypothesis is that people who need help with small jobs in particular turn to their neighbors.

Another consequence of the social capital theory is that people with many resources are attractive network members, and therefore, they have more relationships, including more neighbor relations (hypothesis 11). Existing evidence does not unequivocally support this prediction. The number of neighbor relationships does not seem to depend on the respondent's social class at all; nor does income seem to be related to the number of neighbors in one's personal network (Fischer 1982, 99; Moore 1990). However, people with a higher education do include more neighbors in their networks than lower educated people (Van der Poel 1993). In his

survey of Californian networks, Fischer (1982, 100) noted that neighborhood contact is generally less frequent in low-income areas than in higher income areas, since the former usually exhibit greater variety with regard to race, ethnicity, and occupation. In his study of social relationships among citizens of Cambridge and Belmont in the United States, Laumann (1966, 70-74) noted, however, that although next-door neighbors are quite similar in occupational status and mostly have contacts with each other, their relationships are not (strongly) patterned by occupational similarity. Another reason why people turn to their neighbors is that they have no alternative sources of help (see hypothesis 12). If one has no other members in their personal network, neighbors become the first (and only) choice, even if the relationship with them is weak. This argument was previously made by Guest (2000), who stated that extralocal relationships do influence local ties and that one therefore needs to study both. Already, there are empirical indications that can be interpreted as corroborating this hypothesis. For instance, people in small towns have more neighbors in their networks than individuals in more urban environments (Fischer 1982; Héran 1987a, 1987b; Wellman, Carrington, and Hall 1988). People in small towns might have more contact with their neighbors because they have fewer alternatives for interaction than city dwellers.

Table 1 summarizes the hypotheses resulting from the different theoretical approaches.

Some of the hypotheses taken from the different perspectives are downright contradictory, such as hypotheses 5 and 11 or 2 and 8. Furthermore, the different strands of hypotheses assume that different mechanisms account for contact among neighbors: the underlying meeting perspective mechanism is convenience of spatial proximity, the sharing mechanism is the wish to mitigate interdependencies, and the social capital mechanism is investment in relationships that are likely to be valuable in the future.

Data, Measurements, and Methods

We used data from a national representative study on personal social networks in the Netherlands (the Primary Social Relations and Social Support [PRESOS] data set; see Fiselier, Van der Poel, and Felling 1992; Van der Poel 1993). This data is a follow-up to the International Social Survey Program (ISSP) data gathered in 1986 and 1987. The sample consists of 902 respondents in 74 municipalities and is nationally representative according to relevant sociodemographic characteristics such as sex, education, degree

Table 1
Summary of Hypotheses

Theory	Hypotheses: One is likely to include neighbors in the personal network . . .	No.
Meeting and mating	. . . if there is already one neighbor in the network	1
	. . . if there are ample facilities in the local area	2
	. . . if one spends a lot of time in the area	3
	. . . if the persons one meets in the area are similar in terms of educational background	4
Interdependency	. . . if one has few resources	5
	. . . if the local area is poor	6
Social capital	. . . if one needs many different kinds of help	7
	. . . if there are few facilities in the local area	8
	. . . if one intends to stay	9
	. . . if one expects to need help in emergency situations	10
	. . . if one has ample resources	11
	. . . if one has few alternatives for relations with neighbors	12

of urbanization, and region of residence. The data were derived through face-to-face interviews, which took one and a half hours on average. They provide detailed information on the respondents' social networks and other characteristics, such as their employment history, family members, and membership of voluntary organizations. The PRESOS data are unique in a number of respects, in particular in their deep inquiry into respondents' private and local relationships.⁴

Network Delineation

The networks were delineated according to the so-called *exchange method*. A number of different name-generating questions were posed, quite similar to the questions used previously by Fischer (1982). Respondents were asked to indicate with whom they engaged in a number of activities and support relationships. In a second step, information was collected on characteristics of the relationships and the network members mentioned. This exchange method is widely applied in survey research for delineating egocentric networks (see, e.g., Marsden 2005). The precise wording of the questions is provided in the appendix. The data set contains 4,327 relationships (alters) of 759 respondents (ego).⁵ In all, 15% of these relationships are neighbor relations.

Measurement of the Dependent Variable

The dependent variable in our study is whether a given relationship in a personal network of a respondent is a neighbor. Respondents assigned role relationships to the network relationships they had mentioned in response to the name-generating questions. In total, they could choose among thirteen different role relationships (such as parent, child, friend, partner, and colleague). All items on the different types of support offered or received via the different relationships were coded as dichotomous variables (0 = *network member was not mentioned for a particular kind of support*, 1 = *network member was mentioned*).

Respondents, in addition, were asked to indicate the geographical distance between their home and the homes of their network members (in minutes one needs to reach the network member). We used this question to check the validity of neighbor relationships. In a few cases, a relationship was labeled a neighbor even though it took the respondent more than 15 minutes to reach that person. We omitted these relationships ($n = 20$) from our analyses.

Measurement of Independent Variables

Individual-Level Variables

Meeting perspective. Similarity between alter and the focal actor (ego) was calculated as the absolute difference between the characteristics of the focal actor and those of the network member. Similarity was calculated with regard to having young children, sex, age (in years), being married, and having a job. To assess the time that one spends in the neighborhood, we included the length of residence (in five categories, ranging from less than six months to more than three years) and whether the respondent was employed (coded as a dummy variable).

Sharing group perspective. The respondent's need for help was calculated as a sum score of answers to questions concerning seven different kinds of assistance required during the last months. To indicate that an individual's resources made them less dependent on others we added education and the income of the household (measured in seven and six categories, respectively).

Social capital perspective. We measured respondents' relational alternatives as an indication of their social capital. These were calculated as the number of friends in the personal network who did not live in the

neighborhood. Furthermore, we included children and the number of other household members in the analysis, because household members can provide an alternative to neighbor relationships. Furthermore, following Blum (1985) and Sampson (1988), we measured the intention to stay as respondents saying that they would feel "very sorry" to leave the locality. Finally, we considered the number of types of support available in relationships as an indicator of social capital. Receiving and giving support can be seen as embodying the returns to and creation of social capital.

Individual-Level Control Variables

An individual's sex (1 = *man*, 2 = *woman*) and age (measured straightforwardly) were used as control variables in all of the analyses. Furthermore, we controlled for a person's marital status and whether they had young children, that is, below the age of 12 years (both coded as dummy variables).

Variables at the Level of the Local Area

Three of our hypotheses (hypotheses 2, 6, and 8) relate to the characteristics of the local area where a person lives. To test these hypotheses, we need information on the material resources in a certain area and the number of facilities in that area. Unfortunately, our data do not provide information at the small scale of the local neighborhood. This information is only available at the level of the municipality where the interviewee resides, not the direct residential area or the concrete neighborhood. Ideally, we would have liked to have data at the level of neighborhoods. With regard to municipalities, the Netherlands has more than 450 municipalities, and the area covered by each is rather small.

As said, we are aware that a smaller scale unit to indicate neighborhoods would have been preferable for the analyses. However, we think that our general ideas and arguments can also be tested with data that provide only crude information on the local area of residence, because our hypotheses do not necessarily require information on the characteristics of neighborhoods at the smallest scale. Indeed, our arguments are formulated on the conditions for contact among neighbors, and a number of our hypotheses do not refer to local conditions but to more general conditions regarding the individual actors and the surrounding environment. Furthermore, and more concretely, our argument is not that a certain facility has to be directly next door to the respondent's house in order for it to have an impact on neighbor relationships. Rather, the argument is that if such a facility is easily accessible, it will influence a person's actions in general and his or her relationships in particular. In addition, Dutch policy measures are usually

applied to municipalities and not to smaller entities like the neighborhood. Hence, we gathered information about the municipalities where the respondents resided and considered this to be a proxy for characteristics of the local area of residence. We enriched the data with information about the municipalities by two means: First, we collected characteristics of municipalities from an external source, Statistics Netherlands. Second, we aggregated the information provided by the respondents to the level of municipalities.

The respondents come from 74 different municipalities in the Netherlands, on which information was collected from the Statistics Netherlands Web site (www.cbs.nl). This site allows visitors to download various descriptive characteristics of municipalities, such as population composition, income, and the number of facilities. To measure meeting places, we included the number of libraries, schools, day care centers, and retirement homes as facilities in the analysis. In addition, we included the average aggregate income of the respondents as a measurement of wealth or welfare of the people in the area. We measured intention to stay at the level of the municipalities as well, because for neighboring, not only is the intention of a single individual important but also that of the other group members (see, e.g., Sampson 1988). The same holds true for residential stability. Residential stability was calculated as the proportion of respondents who had lived in the municipality for 20 years or more. Again, the PRESOS data proved advantageous in that it covers a sizable number of municipalities and therefore allowed investigation of conditions at this level.

Control Variables at the Level of the Local Area

To inquire into differences between cities and villages, we controlled for the different degrees of urbanization. These are expressed in number of households per square kilometer: 1 = more than 2,500 addresses, 2 = between 1,500 and 2,500 addresses, 3 = between 1,000 and 1,500 addresses, 4 = between 500 and 1,000 addresses, and 5 = less than 500 addresses. Lastly, to control for the scale of our analysis, we included the size of the municipalities as a variable in the analyses.

Methods of Analysis

As said, our dependent variable is at the level of the network relationships. More precisely, we model the likelihood that a given relation in a person's network is a tie to a neighbor.

All relational data and characteristics of alters are reported by the respondents, and these relationships are statistically (and theoretically) not

independent of each other. The mutual dependence of relationships within a personal network is one reason not to use ordinary least squares regression (OLS) methods on the set of all the relational data (see Van Duijn, Busschbach, and Snijders 1999, 188; Snijders and Bosker 1999). To aggregate the data to the level of the respondents (and use, e.g., the sum, the average, or the standard deviation of certain network variables) is statistically correct but usually implies a loss of information. In addition, aggregation does not make it possible to consider differences between relationships. Multilevel modeling takes into account the nested structure of the data (alters are “nested” within an ego) (see Bryk and Raudenbush 1992; Snijders, Spreeen, and Zwaagstra 1995). The models were estimated with the software program MLwiN 2.1.

The likelihood of having a neighbor in the personal network was estimated in a binomial random coefficient model with three levels—one for the municipalities, one for the respondents, and one for the relationships. Because of differences in numbers of respondents per municipality, group size varies between 5 and 211 respondents. At the level of the relationships, the number of relations per respondent varies between 1 and 20 network members. In general, this does not constitute a problem for the multilevel analysis (see Snijders and Bosker 1999, 52). In hierarchical linear modeling (multilevel analysis) the standard errors of the regression coefficients and variance parameters are not determined by the number of cases per cluster—in this case, the number of respondents per municipality—but in the first place by the total number of clusters, that is, municipalities. The limited number of respondents per municipality implies only that the estimation of the random coefficients that conveys information about individual municipalities is unstable, but this is not the focus of the analysis in our case (see Snijders and Bosker 1999).

Results

Descriptive Analyses

Table 2 reports the characteristics of neighbors and neighbor relationships and compares neighbor relationships with other relationships in the network. About 48% of the respondents have no neighbors in their network. Yet for those who do include neighbors in the network, the proportion of neighbors is substantial: about two out of six persons are a neighbor. The table shows, furthermore, that neighbors are important in a number of respects. Neighbor relationships are quite important for borrowing small

items. Relationships with nonneighbors are not at all important for borrowing items in only about 4% of the cases with regard to “receiving” relations and in about 8% of the cases regarding “giving” relationships. Between 9% (receiving) and 22% (giving) of neighbor relationships are important for minor repairs. Furthermore, compared to the other persons in the network, neighbors are rather important for providing child care. Neighbors are rarely asked for advice or help with relational problems or in case of a depression. Similarly, neighbors are rarely asked for help in the event of an illness such as having a flu.

The multiplexity of neighbor relationships, the number of functions a relationship has, is only slightly lower than the multiplexity of other relationships. In addition, the neighbors mentioned are somewhat older than the other network members, employed somewhat less often, and married more often. The majority of neighbors are met at least once a week. Interestingly, neighbors are known for a shorter period than other network members. An explanation for this finding might be that neighbor relationships are less “portable” than relations with friends or family. If an individual moves to another place, relationships with most of their “old” neighbors decay. Note further that more than half of the respondents can reach their network members within 15 minutes, a finding that indicates that the social networks of the Dutch are, in general, quite locally oriented.

Explanatory Analyses

The next step addresses the frequency distribution of neighbor relationships in personal networks and examines whether including one neighbor in the network enlarges the likelihood of including more (see hypothesis 1). We first tested the assumption made by Van der Poel (1993) that the distribution of network members in particular roles is a Poisson distribution. We found that, compared to a normal distribution, the Poisson distribution indeed represents the data best. Next, we inquired into the degree to which the empirical frequencies deviate from those that were expected theoretically; that is to say, we compared the observed and expected frequencies under the assumption of a Poisson distribution (see Table 3). The sum of the values in the right-hand column of the table results in a chi-square of 238.10. The number of degrees of freedom in a Poisson distribution is $k-2$. The critical chi-square in our case (for three degrees of freedom and a significance level of 99%) is 11.34, which is much lower than the figure that we found. Hence, there is a nonrandom deviation from the expected frequencies of neighbors in the networks. For three or more neighbors in a

Table 2
Characteristics of Neighbors in Personal Networks in the Netherlands
(4,327 Relationships for 579 Respondents; PRESOS 1987)

	Neighbor Relationships (<i>n</i> = 660)	All Other Relationships (<i>n</i> = 3,667)		
Average (<i>SD</i>)	0.89 (1.14)	5.86 (3.18)		
Average for those who have neighbors included	1.74 (1.02)	—		
Range	0–7	0–17		
Frequency distribution				
0	48.7	0.0		
1–2	42.8	15.3		
3–4	7.1	22.4		
5–6	1.2	24.5		
7–8	0.1	17.3		
9–10	0.0	11.3		
More	0.0	9.0		
Age <i>M</i> (<i>SD</i>)	43.4 (14.8)	40.38 (18.07)		
Multiplexity <i>M</i> (<i>SD</i>)	1.95 (1.51)	2.01 (1.46)		
Can be reached within 15 minutes	100.0%	53.2%		
Married or living together	81.2%	66.9%		
Known for five years or more	61.8%	80.9% (including family) 70.6% (without family)		
Employed	43.5%	49.7%		
Meet at least once a week	86.0%	63.5%		
Support	% Received	% Given	% Received	% Given
Personal care	0.5	1.0	1.1	1.7
Household care	1.7	3.6	1.7	3.3
Child care	3.6	7.4	1.9	3.3
Minor repairs	9.2	22.2	9.2	15.4
Flu	1.6	5.5	4.3	5.8
Relational problems	0.6	5.5	1.1	8.9
Depression	0.7	6.9	3.9	11.1
Advice	0.6	5.3	4.4	12.5
Borrowing small things	24.6	42.0	3.6	8.7
Filling in a form	1.2	2.3	4.2	7.4
<i>n</i>	660		3,667	

Table 3
Distribution of Neighborhood Relationships (660 Neighbor Relationships, 759 Respondents; PRESOS 1987)

Number of Neighbors in Network (Value)	Likelihood for Value $p(k, n) = c^k / (e^c * k!)$	Observed Frequency f_{obs}	Expected Frequency f_{exp}	$(f_{obs} - f_{exp})^2 / f_{exp}$
0	0.419	344	318	2.12
1	0.365	188	277	28.59
2	0.161	128	122	0.39
3	0.046	55	35	11.43
4 or more	0.009	44	7	195.57
Σ	1.00	759	759	238.10

Note: k = the particular number of neighbors in the network; c = the average expected frequency of the number of neighbors in the network (660/759); e = natural logarithm.

network, observed frequencies deviate most from expected frequencies—the expected values are much smaller. Therefore, we conclude that our first hypothesis is supported: neighbors as network members seem to come in “packages.”

In Table 4, all other hypotheses are tested. We specified three multilevel models, each addressing three levels (i.e., municipalities, respondents, and relationships). In other words, the models account for the fact that relationships are nested within respondents, who are nested within municipalities. As said, the dependent variable at the lowest level, that of the network relationships, is whether a certain relation in a personal network is a neighbor.

We estimated models 1 and 2 because we also want to inquire into the contribution of the different levels. In model 1, only individual-level variables are included, while model 2 adds variables at the level of the relationships. In model 3, all indicators discussed are included, and this model provides the final test of the hypotheses. This model includes the indicators at the level of the municipality. Another reason for choosing this analytical strategy is the overlap of a number of indicators with regard to the different theoretical perspectives. The three theories are complementary rather than competing, and therefore, a separate test of the theories does not to us seem to be the optimal analytical strategy. The first column of the table indicates the theoretical perspective, of which the different variables are considered to be an indicator.

In the empty model, the average log odds for a neighbor in the network are -2.137 . This is equal to a likelihood of $\exp(-2.137)/(1 + \exp(-2.137))$ or 10.5%. Model 1 tests the hypotheses on the effects of the characteristics of the individual. These are the hypotheses concerning the time one spends

Table 4
Logistic Random Coefficient Model on the Likelihood of Having a Neighbor in the Personal Network (4,327 Relationships of 759 Respondents; PRESOS 1987)

Theory	Model 1 <i>B (SE)</i>	Model 2 <i>B (SE)</i>	Model 3 <i>B (SE)</i>
<i>Municipality-level variables</i>			
Facilities:			
M/SG			-0.083 (0.223)
M/SG			0.002 (0.001)**
M/SG			-0.365 (0.179)**
M/SG			0.063 (0.249)
M			0.032 (0.062)
SG			-0.011 (0.058)
SC			0.159 (0.064)**
<i>Municipality-level control variables</i>			
Urbanization			0.165 (0.174)
Size of municipality			0.183 (0.237)
<i>Individual-level variables</i>			
Similarity:			
M		0.328 (0.101)***	0.335 (0.101)***
M		-0.022 (0.046)	-0.022 (0.046)
M		0.373 (0.073)***	0.369 (0.072)***
M		0.063 (0.134)	0.070 (0.135)
M		0.047 (0.064)	0.098 (0.063)
M		-0.043 (0.062)	-0.045 (0.062)
M	0.065 (0.055)		
M	-0.062 (0.055)		
SG	0.142 (0.049)***	0.088 (0.055)*	0.096 (0.055)*
SG/SC	0.081 (0.049)*	0.109 (0.059)*	0.106 (0.059)*

SG/SC	Income	0.067 (0.059)	0.143 (0.066)**	0.138 (0.067)**
SC	Relational alternatives	-0.296 (0.052)***	-0.326 (0.060)***	-0.318 (0.061)***
SC	Household members	-0.163 (0.076)**	-0.166 (0.084)***	0.173 (0.084)**
SC	Intention to stay	0.206 (0.049)***	0.222 (0.056)***	-0.233 (0.056)***
	<i>Support given:</i>			
SC	Child care		0.120 (0.037)***	0.121 (0.037)***
SC	Minor repairs		0.122 (0.043)***	0.122 (0.043)***
SC	Advice		-0.338 (0.060)***	-0.344 (0.060)***
SC	Borrowing items		0.694 (0.034)***	0.697 (0.034)***
SC	Filling in a form		-0.342 (0.068)***	-0.342 (0.068)***
	<i>Individual-level control variables</i>			
	Children at home	0.077 (0.057)	0.156 (0.066)**	0.154 (0.067)**
	Married	-0.060 (0.058)	-0.369 (0.087)**	-0.379 (0.087)***
	Sex	-0.030 (0.050)	0.048 (0.119)	0.018 (0.057)
	Age	0.008 (0.005)*	0.018 (0.005)***	0.019 (0.005)***
	2 log-likelihood	3381.22	1596.45	791.63
	Intercept	-2.067 (0.050)	-2.385 (0.070)	-2.392 (0.065)
	<i>Explained variance</i>			
	Municipality	—	—	89%
	Individual	46%	57%	57%

Note: M = meeting perspective; SG = sharing groups; SC = social capital; see text for further explanation. The variance estimate at the level of the alter is set at 1 by default by MLwiN. A check for extrabinomial error shows no remarkable deviation.

* $p < .10$, ** $p < .05$, *** $p < .01$.

in the local area (hypothesis 3), the resources that one has (hypotheses 5 and 11), the general need for support (hypothesis 7), the intention to stay (hypothesis 9), and the number of relational alternatives that one has (hypothesis 12).

The model shows that older and higher educated persons are more likely to have neighbors in their networks. Quite important is the effect of a respondent's need for support: those who are in need of many kinds of help have more neighbors in their networks. Furthermore, network members residing outside of the direct local area do provide an alternative; the more friends one has outside the neighborhood, the smaller the likelihood of also having neighbors in the network. The same holds true for households that have many members. In addition, it matters whether one wants to stay in the neighborhood. We found no effect of being employed, having a higher income, or being married.

In the next column, model 2, characteristics of the network members and the support relation between ego and alter are added. This model tests hypotheses 4 and 10, respectively, on the effects of similarity between the respondent and the neighbors and on the effects of the specific type of support needed. In this model, the individual need for support lost significance, because the support that a respondent gives to and receives from others is included. The model shows that particular relational activities, such as advice in important life situations and helping to fill in a form, predict that a particular relationship is not a neighbor. The most popular activity among neighbors is borrowing small items. Furthermore, taking care of each other's children is a typical form of support neighbors give to each other, as well as helping each other with minor repairs and other odd jobs in and around the house. Concerning similarity between the respondent (ego) and network member (alter), the model shows that similarity in sex and marital status between ego and alter particularly enhances neighboring.

The last column, model 3, inquires into our municipality-level hypotheses (hypotheses 2, 6, and 8). In general, about 10% of the total variance results from variation between municipalities. If the level of municipalities were not included in the analysis, this variation would wrongly be attributed to the individual. Regarding facilities, results show the following: where there are more day care centers there is less neighboring, primary schools weakly enhance neighboring, and the other indicators for facilities have no effect. Furthermore, at the macro level, the intention to stay has a positive effect on the inclusion of neighbors in networks. Finally, we found no effects of urbanization and size of the municipality. In bivariate analyses, urbanization does have an effect, but size of municipality does not.

Conclusion and Discussion

A number of conclusions can be drawn from our study of the neighbor relations of the Dutch. As to our descriptive results, first, about half of our sample of respondents included no neighbors in their network. For those who do have neighbors in their network, neighbors turn out to be a substantial part of the personal networks: on average, one-third of the network members are neighbors. People particularly turn to their neighbors to borrow small items. There are, however, many types of help that are definitely not or hardly ever provided by neighbors, such as advice concerning important life decisions and help to fill in a form.

Second, a comparison of neighbor relationships with other ties in the personal network shows quite a few differences. Because of availability, one meets neighbors more frequently than other network members. Compared to other network members, neighbors are less likely to have a paid job, they are somewhat older, and the multiplexity of relationships with neighbors is slightly less. Surprisingly, respondents know their neighbors for a shorter period than the other personal network members, even when family members are excluded. We interpret this finding as an effect of the lower portability of neighbor relationships throughout a person's life.

Third, not all of our hypotheses are confirmed. Table 5 summarizes how our findings bear on these hypotheses.

The evidence for the meeting perspective is mixed. Although it is the most basic principle for the emergence of relationships, meeting does not seem to be enough for maintaining relationships. Apart from primary schools, the different facilities in an area do not enhance neighborhood contacts; on the contrary, they are associated with less neighboring. Particularly interesting is the finding that the existence of day care centers hampers contacts among neighbors. Neighbors in the Netherlands provide an important function in caring for each other's children. This finding is relevant for policy makers. Recently, a major Dutch newspaper did speculate on the effects of an increasing number of day care centers. The expectation formulated in that newspaper was that the labor market participation of women would increase marginally, while contacts among neighbors would decrease drastically.

In addition, network members do indeed come in "packages," not as single persons. Having one neighbor on the network increases the chance to include a second one.

Concerning the hypotheses resulting from the interdependency perspective, the evidence is mixed too. If education and income are seen as a resource, the hypothesis is even falsified—higher educated people and those

Table 5
Summary of Results

No.	One is likely to include neighbors in the personal network . . .	Result
Meeting and mating		
1	. . . if there is already one neighbor in the network	Confirmed
2	. . . if there are ample facilities in the neighborhood	Confirmed for primary schools
3	. . . if more time is spent in the neighborhood (e.g., because of long-term residence or unemployment)	Confirmed for primary schools length of residence
4	. . . if neighbors are similar in social background characteristics	Confirmed for sex and being married, not confirmed for having a job and age
Sharing groups		
5	. . . if one has few resources	Not confirmed
6	. . . if the neighborhood is poor	Not confirmed
7	. . . if one needs support	Confirmed, but effect vanishes if support relations are included
8	. . . if there are few facilities in the neighborhood	Confirmed for day care centers
Social capital		
9	. . . if one intends to stay	Confirmed
10	. . . if one needs help with minor jobs or in emergency situations	Confirmed
11	. . . if one has many resources	Confirmed for education and income
12	. . . if one has few material or relational alternatives for neighbor relationships	Confirmed

with more income have more neighbors in their personal network. Yet the finding that day care facilities dampen neighborhood contacts, discussed above, is also in line with the implication of the sharing group theory.

With regard to the social capital perspective, the intention to stay is important for an individual's neighboring behavior. In addition, similarity, in particular with regard to sex and marital status, is important for contacts among neighbors. If a high education is considered to be a valuable resource, the hypothesis is sustained: persons with a better education are more likely to have neighbors in their networks. The same holds true for income. Lastly, as expected, relational alternatives outside the neighborhood work against neighbor contacts.

In summary, of the three theoretical perspectives, the social capital perspective receives the most empirical support. The theory of social capital is especially attractive in that it allows for relatively precise predictions on relational characteristics. Moreover, adding relational characteristics to the analyses greatly increases the model fit. The hypotheses directly based on the investment idea—that is, those related to the shadow of the future and to alternative relationships—are confirmed. Evidence is mixed for the central hypotheses from the meeting and interdependency perspectives. Whether hypotheses on the resources of an individual and the facilities in the neighborhood are supported seems to depend on the type of indicators used in the analyses.

Finally, with regard to the different levels of analysis, neighbor relationships are largely conditioned by characteristics of the relationship and of the individual, in particular, the need for support, the kind of help provided by the network member, and similarity between the interaction partners with regard to age and sex. Effects at the municipality level are much weaker. In particular, the number of day care facilities in a municipality has a negative effect on neighborhood relationships.

Discussion

Neighbor relationships are an important—though not the only—condition for the creation of local communities (see Völker, Flap, and Lindenberg 2007). In light of the widespread discussions on the decline of community, a study devoted to one of its aspects—neighbor relationships—is quite valuable. In this contribution, we have shown some of the conditions on which neighbor relations hinge. We found that the characteristics of the particular neighbor, the function of the relationship for the actor in question and the characteristics of this actor, and the characteristics of the wider environment (i.e., in our analyses, the municipality), all do matter for the likelihood of neighbor relations. Given our crude measurement of neighborhood municipalities and the small number of municipality characteristics available in the data, it is intriguing that, even with such rough measures, statistically significant effects can be found.

Furthermore, it is remarkable that municipality characteristics do matter for individual actions. In particular, this finding might be relevant for policy makers, who usually implement measures at the level of a municipality. Facilities such as day care centers are much more open to policy manipulation than, for example, the social composition of a street or a small-scale neighborhood.

Although our findings on the impacts of municipality-level characteristics seem to be at odds with much research on neighborhoods, we are certainly not the first to emphasize this association between municipalities and local relationships. Dekker (2006), for example, discussed the role of public authorities and urban governances for social cohesion in neighborhoods, and she emphasized that systematic knowledge on the impact of governance is lacking. Furthermore, Crenson (1974) provided evidence based on a number of case studies of the importance of governmental action for civic participation.

Future data collection should focus on gathering detailed information on neighborhoods at a scale considered relevant to the individual. A typical neighborhood that affects an individual's life and perception probably consists of no more than the two or three streets in the direct vicinity of the home. In addition, municipalities should be taken into account, since we found that some characteristics matter at this level. Not all facilities that people use are as local as their immediate neighborhood, but they do matter for their local interactions with neighbors and for their daily life in general. Our general arguments here related to the local environment as an area larger than just the few streets of a certain neighborhood. In addition, day care facilities and schools are much better measured at the level of municipalities, since neighborhoods as an entity are too small in this case. Two effects at the level of municipalities are of particular interest in this reasoning. First, schools seem—in line with our expectations—to indeed fulfill the role of meeting places where persons have the opportunity to start relationships with others. Note that nearly all children in Dutch schools and their families live in the direct vicinity of the children's school. Furthermore, in the Netherlands, school lasts until the afternoon and children are then picked up, usually by one of their parents. At most schools, parents wait outside until the children are dismissed. A by-product of this convention might indeed be higher numbers of contacts among parents, whose children share the same school and who also live in the same local environment. Another interesting explanation for this finding is provided by Feld (1981). According to Feld's focus theory, the more foci people share, the higher the chance that they will form a social relationship. Sharing a school and a residential area implies at least two foci.

Second, day care facilities—unlike schools—seem to hamper contacts among neighbors. An explanation for this finding was sketched above; that is, neighbors are important in taking care of children. This finding is an interesting example of how government policy may interfere with people's private relationships (Völker and Flap 1997, 2001). Both findings deserve further research.

We found, furthermore, that a considerable number of people—nearly half of all respondents—had no contact with their neighbors (see also Fischer 1982, 98). This finding also warrants further analyses.

In addition, we found that the personal networks of the Dutch are quite locally oriented: more than half of the network members can be reached within 15 minutes. This refutes the assumption that networks have become placeless nowadays (cf., Fischer 1982; Wellman, Carrington, and Hall 1988; Wellman 1999). Future research should devote attention to the costs of engaging in and entertaining relationships and the factors that make specific ties convenient solutions to everyday needs. Our finding that ties to neighbors come in packages points in this direction.

In a recent publication, we built upon this line of thought and conceived community as a multifunctional group in which members attain multiple important goals. We showed that a large and rich network in the neighborhood, or more precisely, having few relational alternatives outside the neighborhood, promotes the growth of an efficient local community (Völker, Flap, and Lindenberg 2007).

Another question for future research is the extent to which characteristics of neighborhood networks are at least partly the outcome of people's (self-)selection of particular neighborhoods (Sampson, Morenoff, and Gannon-Rowley 2002), since these processes affect the social composition of the neighborhood and neighborhood networks. However, this question is far beyond the scope of this contribution.

Our results also have implications for other general theoretical ideas in addition to those that were analyzed here. For example, our finding on the effects of relational alternatives to neighbors refutes the prediction of modernization theory, that networks have become less supportive: if people do not turn to their neighbors for support it is because they have a larger network beyond the local area where they live. Moreover, unlike Fischer (1982) in the United States, we found no differences in neighboring between more or less urbanized areas. A reason for this might be that regional differences in the Netherlands are generally not large. The Netherlands is a country with highly developed urban planning and more general planning of the environment. Above all, it is a small country with a well-developed system of public transport. Even from the relatively rural regions, urbanized areas can be reached quite easily because of their proximity and the ease of transportation. To illustrate, the bicycle is the item most frequently reported as stolen to the police in the Netherlands. Therefore, common ideas on rural regions, for example, that people are more dependent on each other there than in urban areas, might not apply in

the Netherlands. In other words, the Dutch case, which we now add to the U.S.-centered literature on neighboring, is particular in the sense that the Netherlands is a largely urbanized country, with only slight differences in urbanization across its regions. Even individuals who live in small villages have easy access to a larger city.

To conclude, this investigation of neighbors in personal networks of the people living in the Netherlands showed that people do not have many neighbors in their personal networks and that many people have no neighbors at all in their networks. It also established that the number of neighbors in personal networks can be explained by particular conditions, before all, the degree to which people are dependent on one another and their need of help and assistance.

Appendix

Network-Delineating Items

Did you help a person with their house or personal care? Think about help in getting dressed or undressed, taking medicine, eating, washing, and so on.

Did you help a person care for or clean their house? Think about cleaning, but also shopping or cooking.

Have you regularly taken care of another person's children, because neither parent was at home? In and around a house there are often odd jobs to do for which help is needed, for example, holding a ladder, helping move furniture, and so on. Did you help anybody with these kinds of jobs during the last three months?

Whom did you help with shopping or other kinds of caring because the person had the flu and had to stay in bed?

With whom did you talk about your relational problems?

With whom did you talk about your depressed mood?

Whom did you give advice concerning a major life change?

From whom did you borrow small items like bread and sugar during the last three months?

Who did you help fill in a form for government, insurance, or the like?

Note: The time frame for the questions is the last six months unless otherwise stipulated. All questions were asked both for having given help and for having received help.

Notes

1. An example of this is provided by Utasi (1990). In a comparative study on friendships in various industrial countries, she recounts in an analysis of the International Social Survey Program (ISSP) data that Hungarians met almost no friends in the area where they live, whereas Italians recruit most of their friends from the local environment. This difference is probably because of differences in meeting opportunities in these countries. In the 1980s,

Hungarians often had more than one job and therefore spent little time in the area of their dwelling. During the same period, unemployment was high in Italy and people often worked only on a short-term or freelance basis, and hence spent more time in the area where they lived.

The ISSP is a continuing survey program in which several European countries participate. Each year, special attention is devoted to a particular topic. In 1986, this topic was personal networks and social support. For more information on the data see Höllinger and Haller (1998).

2. We are using a particular theoretical perspective on social capital here, that is, one directed to actions and characteristics of an individual. There is another theoretical perspective on social capital that is directed more to the collective or group level (see, e.g., Halpern (2005) for a review).

3. Other findings supporting these assumptions are that young and elderly people have more contact with their neighbors than other age groups. Married people, and in particular families with children, also have more contact with their neighbors. In addition, women mention more neighbors in their personal networks (Campbell and Lee 1992; Van der Poel 1993, 122-25; Bridge 1994). All of these social groups usually reside longer in a given local area and have a long "shadow of the future and the past" which influences their investment in relationships with neighbors.

4. For the present contribution we used PRESOS data, and not the more recently collected Social Survey of the Networks of the Dutch (SSND) that we used for Völker, Flap, and Lindenberg (2007). The PRESOS data contains more name-generating questions that inquire directly into the private social world of Dutch citizens and that delineate neighbor relationships more straightforwardly than other data. Furthermore, the number of municipalities is twice as large as in the SSND, better enabling us to analyze conditions that matter at the level of the municipalities. This makes the PRESOS data unique. These characteristics of the PRESOS data make them particularly apt to test our arguments, although they are somewhat dated. Yet, we think that the point of measurement is not a major issue because our ideas are general and extracted from important and popular theories in the field. These theories do not involve assumptions on time (or place).

5. Note that we focused only on support actually given, not on potentially given support, which is also mentioned in the questionnaire.

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